Parks Canada Parcs Canada

ENVIRONMENT CANADA - PARKS
CAPITAL CONSTRUCTION PROJECT DELIVERY

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ENVIRONMENT CANADA - PARKS
CAPITAL CONSTRUCTION PROJECT DELIVERY

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ENVIRONMENT CANADA - PARKS

CAPITAL CONSTRUCTION PROJECT DELIVERY

1.0 BACKGROUND

Environment Canada - Parks manages a capital contruction budget of over $50 million each year in the development and recapitalization of the National Parks, National Historic Parks and Sites and Heritage Canals. Although each region has a method to handle their construction program and respond to regional and national approval requirements, there exists a lack of uniformity in the overall approach.

Analysis by the study team examining the engineering, architecture and general works function in 1984 concluded that "enhanced front-end planning project control and accountability are possible by implementing a more standardized approach. The responsibilities at the three organizational levels for various phases in the delivery process must be clearly delineated if the capital project delivery is to become more efficient".

Accordingly, the team recommended that:

> "the Director, Engineering and Architecture Branch, formalize and implement a uniform capital project delivery system"
>
> Recommendation No. 20
> Engineering, Architecture and
> General Works Study
> April 1984

2.0 OBJECTIVES

This document describes a general system which links together the standard elements required to plan and implement Parks capital projects. This system is not a new development. Rather, the document attempts to tie together the various "actors", "procedures" and "approvals" encountered during the course of a project's development and put these elements into perspective and relation.

This document is to be used for reference purposes, along with related publications, mainly by E&A functional staff at all levels involved in construction project delivery.

The formalization of the capital delivery system herein is not intended to eliminate additional project-specific or region-specific requirements and procedures. The objective is to clarify the fundamental delivery process within Parks Canada and specify the requirements for input, consultation and approvals at all major stages. The use of a standardized approach will improve the quality of planning during the front-end phase and enhance overall project control and accountability.

3.0 DEFINITIONS

PIPS: Project Initiation and Planning System. It is designed to function as a planning and reporting system in the development of capital projects during the problem definition, project definition, preliminary design and implementation stages.

PIP or PIPs: Acronyms sometimes used to refer to the approval document package.

PAD: Project Approval Document. The title of one of the three forms to be submitted of approval request. This form is also sometimes referred to as the PIP 1.

PIP 2: The Project Justification form of the approval document package.

PIP 3: The Cost Computation Data form of the approval document package.

MYOP: Multi-Year Operational Plan

LTCP: Long Term Capital Plan

TEC: Total Estimated Cost. The total aggregate cost of a project, from Concept Approval (or Problem Definition Approval) to implementation.

Project Management: The overall management of the capital project from project definition to project completion. It includes overall planning, organization and coordination of activities and input required to permit effective management of the project. It includes also ensuring progress is made towards approved objectives according to plan and that corrective action is taken whenever and wherever necessary. Normally, for construction projects the Project Manager is provided by E&A. Complex projects involving other disciplines than E&A (e.g. archaeologists, interpreters, etc.) may be managed by Planning and Development.

4.0 REFERENCES/RELATED DOCUMENTS

TB Administrative Policy Manual Chapter 148, "Cost Control of Projects"

TB Circular 1983-25, Approval of Capital Projects and Long Term Capital Plans

General Service Agreement Between the Department of Environment (Parks Canada) and Public Works Canada Including Procedures for Implementing Projects Through Public Works Canada (May 1984)

Parks Long Term Capital Plan (LTCP)

Administrative Directive 1.5.4, Delegation of Authority

Management Bulletin 2.1.5, Amplification on Delegation of Authority

Management Bulletin 2.1.6, Use of the Project Approval Process

Management Bulletin 2.1.7, Project Initiation and Planning System (PIP) Screening Process for Functional Review of Capital Projects

Management Bulletin 2.1.8, Allocation and Utilization of Capital Person-Years

Management Bulletin 2.1.9, PIPS Preparation for Project Approval

Administrative Directive 1.5.1, Definition of a Capital Expenditure

E&A and General Works Study (EA-PC-84-12) (EA-PC-84-13)

E&A Manual 42.6, Guidelines for the Preparation of a Project Brief and Design Brief

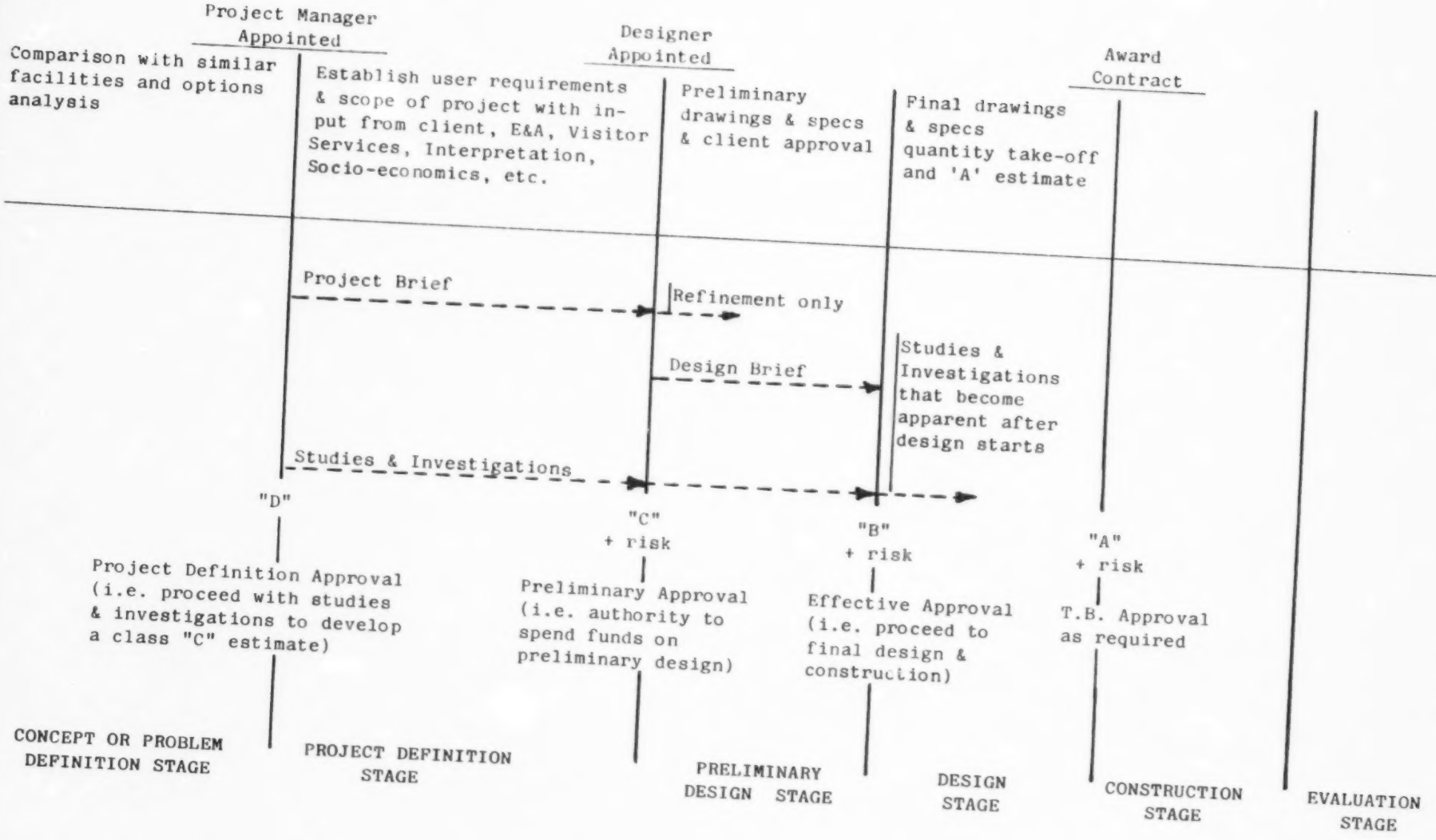
E&A Manual 42.7, Guidelines for the Preparation of a Project Completion Report

E&A Manual 42.5, Risk Estimation Guidelines for Construction Projects

E&A Manual 42.9, Construction Supervision and Field Records

Contract Services Branch Management Bulletins

CAPITAL CONSTRUCTION PROJECT DELIVERY SYSTEM OUTLINES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5.0 FRAMEWORK FOR PROJECT DELIVERY

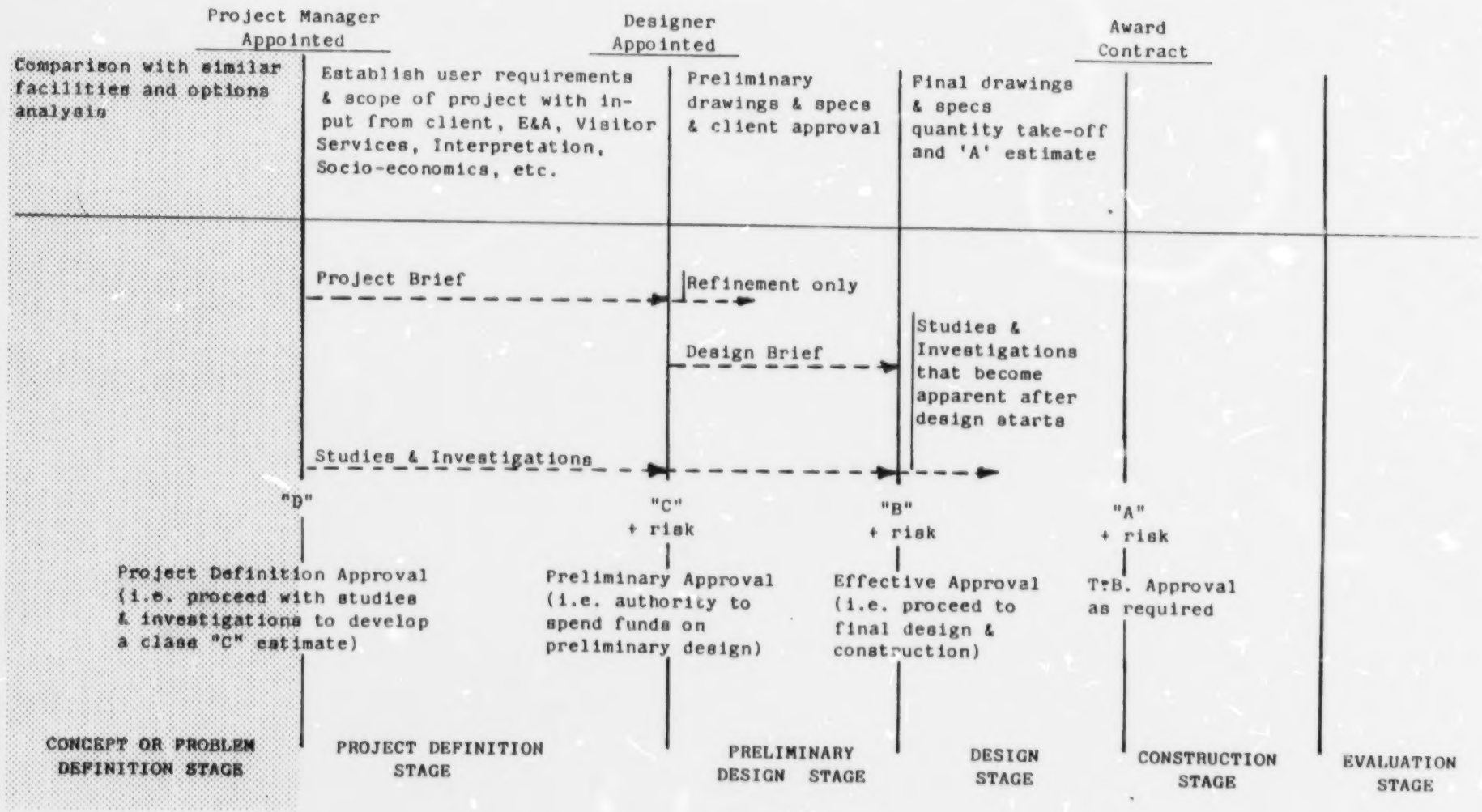
In order to ensure proper planning and obtain required approvals, capital projects in Parks are generally staged as follows.

1. Concept or Problem Definition (ending with the project Definition Approval
2. Project Definition (ending with the project Preliminary Approval)
3. Preliminary Design (ending with the project Effective Approval)
4. Design (ending with tender call and construction contract award)
5. Construction
6. Evaluation

Each stage includes various potential tasks and participants with varying responsibilities depending on the specific task and scope of project. These will be described in the following sections, along with funding requirements and approval procedures necessary to advance the project to each successive stage.

Whereas major new development would generally require all stages to be executed, recapitalization work, which is major repair or replacement of existing facilities in kind, may not require some of the stage 1 - concept, and stage 2 - project definition tasks to be performed. This would have to be evaluated on a project-by-project basis.

CAPITAL CONSTRUCTION PROJECT DELIVERY SYSTEM OUTLINES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5.1 CONCEPT STAGE

Initiated from:

- Problem Definition
- approved area development or management plans, or
- recommendations of operations review, or
- routine expansion, renewal or replacement of services or facilities, or
- change in departmental/regional policy, priorities, or
- emergency

Objective: to initiate the project and establish broad terms of reference by identifying criteria, major policy issues and options to be considered in the solution generating process

Funding: Concept Stage activities (i.e. studies) are normally funded within the authority delegated to Directors General of Regions. For studies with an estimated cost greater than that delegated to directors general for concept development, approval must be obtained from the Director, PP&A (on behalf of the ADM), prior to proceeding with the activities outlined.

CONCEPT STAGE (Cont'd)

Tasks:

- Identify needs
- Establish goals and objectives
- Develop and analyse options
- Prepare Class "D" estimate
- Prepare submission for Concept or Project Definition Approval

Requirements for Project Initiation and Planning Document for Project Definition Approval:

In general, a request for approval is made up of three separate forms

- Project Approval Document (PAD)
- Project Justification form
- Cost Computation form

The request for Project Definition Approval should contain:

- a description of the need and a statement of the end results desired in terms of overall goals and objectives. Objectives must be expressed in measurable terms,

CONCEPT STAGE (Cont'd)

i.e., population to be serviced/housed/ sheltered, traffic to be borne, dimensional elements in broad terms (length of road, standards to be applied). Often the need identification may result in the identification of the requirement to develop an area within a park, which will eventually become several separate capital projects. The first stage of project development may address the "area development" as a whole and individual project identification will take place during the Project Definition Stage (Stage 2);

- an identification and analysis of various concepts. All alternatives should be presented using written descriptions, drawings, diagrams or photos; ideally option analysis should be done prior to the User Requirements. However, in many cases, the various options will be judged on how well they meet the User Requirements. User Requirements will be, in those cases, prepared prior to the Option Analysis.

CONCEPT STAGE (Cont'd)

- an indication of the relationship of the concept to Park Management Plan;

- a simple location/site plan to give idea of recommended physical location and an indication of possible application of Parks standards and/or guidelines;

- an identification of the probable cost expressed as a Class "D" cost estimate (a Class 'D' is a preliminary or conceptual estimate prepared in comparison with similar facilities to indicate the magnitude of a proposed project);

- an identification of the advance planning funding required to develop a Class 'C' cost estimate;

- input from the Facility Evaluation System (FES) and the Road Inventory and Priority Rating System (RIPRS) where applicable;

CONCEPT STAGE (Cont'd)

- some indication of priority of this project at this stage;

- code and identification number

Consultations and Approvals:

In existing Parks/Sites, the Park recognizes the need and establishes the social, economic and environmental goals and prepares the approval forms. It is recommended that the Park obtain technical/professional assistance from Regional Staff in preparation of the approval forms. Normally the Regional Director General would not sign a Project Approval Document unless the E&A Director at the region has approved it. Therefore, to start the project on sound bases and in the interest of speeding-up the process, the park should consult with E&A before going to the trouble of submitting the forms.

CONCEPT STAGE (Cont'd)

At H.Q., E&A will not consider a project unless it has regional E&A approval. Functional review groups can recommend additional studies and/or research which should be done prior to next approval milestone.

Regional Programming (Planning and Development) is usually the focal point for the approval process as the project evolves through the various stages.

NOTE: Normally the first submission is for Concept Approval. Prior to submitting it, an option analysis should be carried out. The various options studied are given and the reasons for selecting one. Regions can spend up to their level of approval on option analysis without HQ approval. If more is to be spent then a request for approval has to be submitted before Stage 1 to get funds for the option analysis. This is a rare occurence.

CONCEPT STAGE (Cont'd)

The level of approval depends on the total estimated cost of the project.

The following table reflects the current approval limits for capital projects:

Total Estimated Cost ($)	Recommended for Approval By	Approval Authority
up to 20 K	--	Park Supt.
20 K to 150 K - 250 K	Park	Regional Director General
150 K - 250 K to 5 M	Park/Reg. D.G.	HQ/ADM
Over 5 M	Region/ Headquarters	Treasury Board

CONCEPT STAGE (Cont'd)

Note: As of September 1985 the approval limits for capital projects are:
150 K in Ontario and Quebec Regions
200 K in Western Region
250 K in Atlantic and Prairie and Northern Regions

Comment: The Concept Stage is necessary to define the nature and scope of a project at a time when various implications can be more readily determined and negotiated before costly commitments are made; to provide clear terms of reference for later stages with respect to content, time, cost and energy use; and to provide a basis for project control by different parties concerned. It also provides a means by which management can conduct a preliminary screening of potential projects and thereby ensure that only essential and well justified projects are initiated, particularly during time of fiscal restraint.

CONCEPT STAGE (Cont'd)

Approval Milestone:

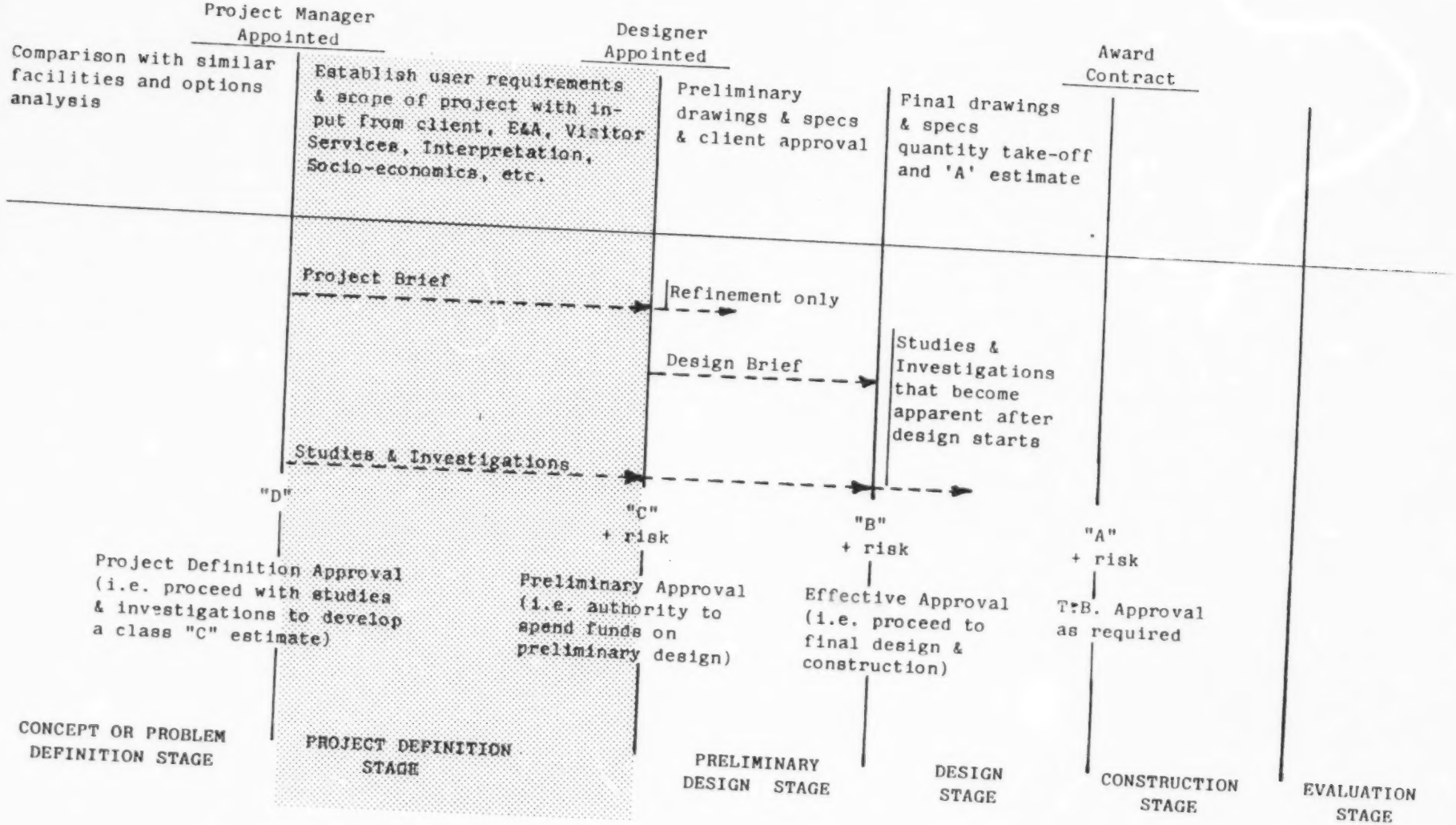
Project Definition Approval (i.e. Approval of the Development Concept and authority to proceed with studies and investigations sufficient to develop a Class "C" estimate during the Definition Stage).

Commitment of Funds:

- Construction funds generally designated in year 4 or 5 of the Multi-year Operation Plan.

- Project Definition funds committed.

CAPITAL CONSTRUCTION PROJECT DELIVERY SYSTEM OUTLINES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5.2 PROJECT DEFINITION STAGE*

Initiated from: Project Definition Approval.

Objective: to gather sufficient information and data to obtain Preliminary Approval for the entire project and to obtain specific funding approval for the pre-design and design elements of the project.

Tasks:

- Appoint project manager and select team
- Prepare Consultants Terms of Reference
- Establish User O&M requirements
- Perform feasibility studies
- Assess environmental impact
- Perform technical evaluations
- Prepare Project Brief
- Do Class "C" Estimate and risk
- Prepare submission for project Preliminary Approval

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* The Definition Stage of the Capital Project Delivery System is the most critical stage of the entire process.

PROJECT DEFINITION STAGE (Cont'd)

Requirements for Project Initiation and Planning Document for Project Preliminary Approval:

- A general summary indicating the purpose of the PIP #2, the overall scope and scale of the project and the total cost of the project (expressed as a Class "C" cost estimate and risks). A Class "C" is an estimate prepared when the user requirements and scope of the project are known, the studies and investigations have been substantially completed, and the project brief has normally been prepared.

- A brief statement to tie the project back to the concept stage and to the management plan, if applicable.

- An identification of implications of the proposed solution, including, as applicable:

PROJECT DEFINITION STAGE (Cont'd)

- operation and maintenance requirements;
- financial implications (O&M and Capital);
- life cycle costing;
- socio-economic implications;
- EARP statement (Environmental Assessment and Review Process)
- results of research
- land and building investigation/acquisition
- technical feasibility.

- A detailed implementation schedule.

- A description of the end product in terms of size, scope, scale and quality.

- A Project Brief (the project brief will eventually be given to the designer in order to carry on studies, investigations, and design). It should contain all constraints, requirements and pertinent data. (Refer to E&A manual 42.6, Guidelines for the Preparation of a Project Brief and a Design Brief.)

PROJECT DEFINITION STAGE (Cont'd)

NOTE: The Project Brief should accompany the request for Preliminary Approval. As it is an E&A document the Project Brief can also be submitted separately, but before the Project Preliminary Approval. All Project Briefs of projects over $400,000 are to be sent to E&A, HQ, for review. It is highly desirable that Project Briefs for all projects over $150 K be sent to HQ and the content only referred to on the PIP forms.

As a general rule a Project Brief should be prepared for projects of any size.

Consultation and Approvals:

When preparing the documents for Preliminary Approval request, the project manager must ensure that there is wide input. Too often, some groups or individuals who should have

PROJECT DEFINITION STAGE (Cont'd)

been consulted are missed, and this necessitates design revision at a later date. The project manager should consult with the designer (if already identified) while preparing the documents for Preliminary Approval, especially the Project Brief.

Refer to the Capital Construction Project Delivery Chart for identification of input and approval needed.

The level of approval is the same as for the Concept Approval.

Regional Programming is the focal point for conducting the project Preliminary Approval process.

Comments: The appointment of a Project Manager and the formation of a project team at the beginning of the project definition stage ensures:

- appropriate leadership for the coordination of the project development process;

PROJECT DEFINITION STAGE (Cont'd)

- appropriate representation of the specialty functions required for the most probable solution;

- that the "client's" representative is an authorized and responsible spokesperson for the parks interests and will maintain this role, preferably for the duration of the project;

- an adequate response to the liaison requirements of the project;

Normally, for construction projects, the E&A regional components will provide the project manager. If the project manager is not from E&A, the team should have at least one E&A member.

The E&A Study (1984) has recommended that, for capital projects, "all project managers be accountable to their regional engineering and architecture manager in accordance with the delegated roles and responsibilities" (Recommendation #22).

PROJECT DEFINITION STAGE (Cont'd)

The project team examines in more details the needs identified during the concept stage and review the various options identified as to their capacity to meet these needs. Finally the most effective and economical solution is recommended by the Project Manager.

In short, Stage 2 defines the full range of user requirements and technical criteria governing the project's content, cost, schedule, in sufficient detail to control the design of a product that will satisfy the client, and help the project manager and his team in monitoring and controlling the project. The strategy for the preliminary design, design and construction stages is defined and the project management control systems are put in place.

Approval Milestone:

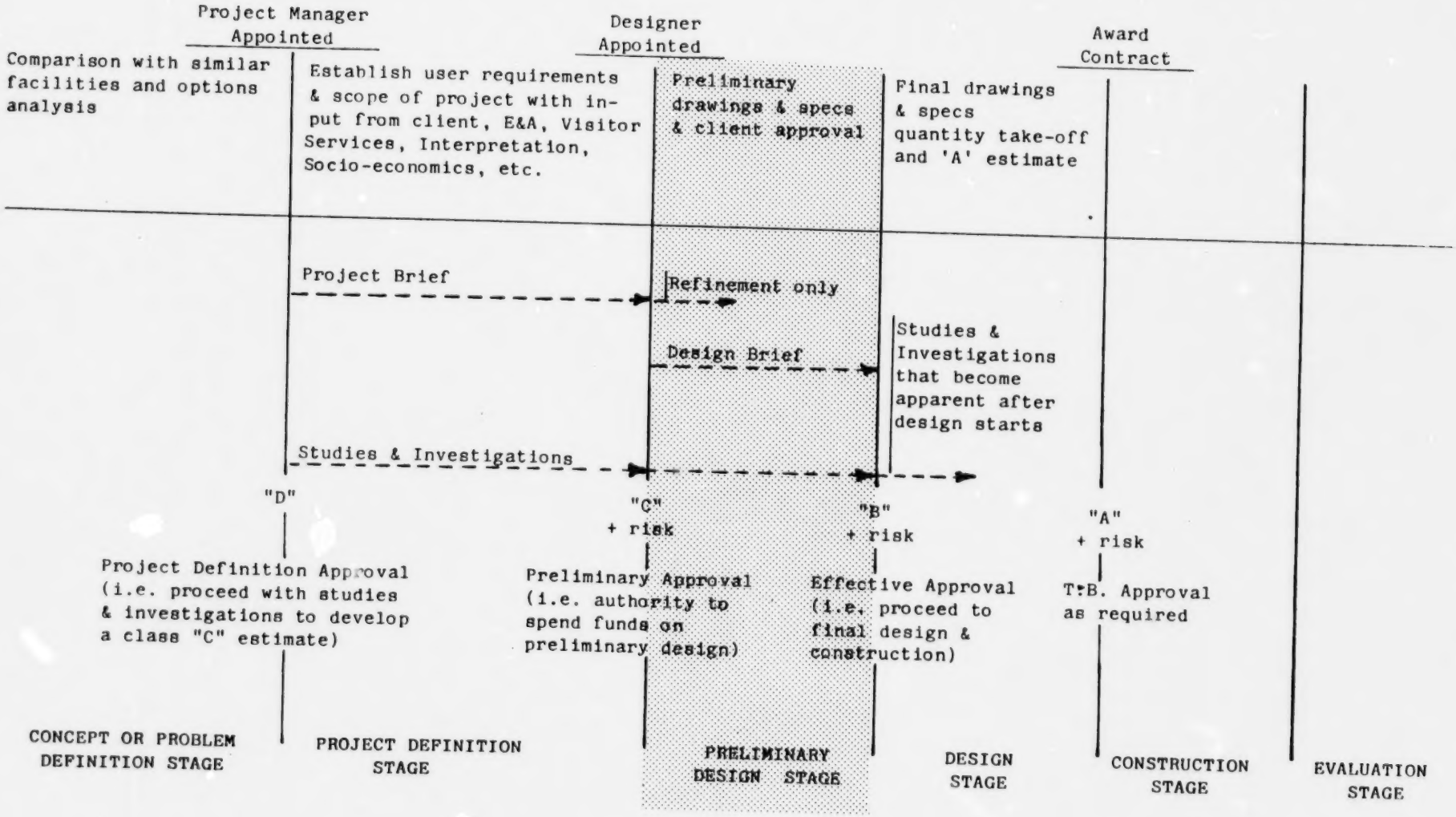
Project Preliminary Approval (approval of Definition Stage and authority to spend funds on Preliminary Design and in some cases on full design).

PROJECT DEFINITION STAGE (Cont'd)

Commitment of Funds:

- design and construction funds in applicable year of MYOP
- design/consultant costs for Preliminary Design Stage (stage 3)

CAPITAL CONSTRUCTION PROJECT DELIVERY SYSTEM OUTLINES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5.3 PRELIMINARY DESIGN STAGE

Initiated from: Preliminary Approval

Objective: to provide preliminary design data detailed enough so that agreement with the client can be reached before final design (working documents) gets underway.

All the work should be done in accordance with the content, time, cost and quality criteria defined in the Project Brief. The product may include site plans indicating proposed grades, structures, and planted materials, floor plans, elevations, representative sections, mechanical and electrical outline drawings, building and site subsystems, including proposed materials and equipment (see E&A Manual 42.6).

Tasks:

- Transfer of Design Funds
- Select consultant for design (optional)
- Undertake engineering, geotechnical and other technical studies and investigation prior to final design.

PRELIMINARY DESIGN STAGE (Cont'd)

- Prepare Design Brief
- Prepare preliminary plans and specifications
- Establish time and cost scheduling and construction methods
- Prepare Class "B" estimate and risk
- Prepare submission for project effective approval

Requirements for Project Initation and Approval Document for Effective Approval:

The documents for approval request should contain:

- A Design Brief giving as much detail as possible on proposed dimensions, layouts, evaluations, construction materials, loadings, costs, schedules, etc. (See E&A manual 42.6, "Guidelines for the Preparation of a Project Brief and a Design Brief".)

PRELIMINARY DESIGN STAGE (Cont'd)

NOTE: Being an E&A requirement the Design Brief can be submitted separately but is required before Effective Approval is given. All Design Briefs of projects over $400,000 are to be sent to E&A, HQ, for review. It is highly desirable that Design Briefs for all projects over $150 K be sent to HQ for review.

- A Class "B" estimate giving the total estimated cost of the project, expressed both in constant and current dollars, including a provision for normal contingencies. Inflation adjustments are taken care of by PP&A. (A Class "B" is an estimate prepared after minor refinements to the user requirements have been made in the project brief, detailed site investigations and studies have been completed, and the preliminary design has been established in the design brief. It is the minimum class of estimate required to obtain effective approval, i.e., to proceed to construction.)

PRELIMINARY DESIGN STAGE (Cont'd)

- An evaluation of risks presented separately from the Class "B" and in accordance with the E&A manual 42.5, ("Risk Estimation Guideline for Construction Project") and TB Administrative Manual, (Chapters 140 and 148). This is required to inform Treasury Board or Parks Management of potential uncontrollable future expenditures, difficult to avoid without abandoning the project. Risks are not normal contingency allowances.

- A proposal for the management, control and accounting of contingency funds and other specific allowances.

- The cost implications of any reductions or increases in person-years (O&M and/or Capital), operating and/or capital expenditures that may result from the completion of the project.

PRELIMINARY DESIGN STAGE (Cont'd)

- The planned arrangements to ensure satisfactory project management and technical performance.

- The planned time phasing of the expenditures, from project commencement to completion dates and the cash flow for the period in between.

- A statement that the physical execution of the project has not yet begun, other than the specific aspects authorized in the preliminary approval.

- The priority rating of the project at this stage.

- Any information concerning public announcements already made or intended to be made.

PRELIMINARY DESIGN STAGE (Cont'd)

Consultations and Approvals:

For more details refer to the Capital Construction Project Delivery Chart.

The Project Manager and the Project Team established during Stage 2 (Project Definition) is responsible for directing the project through the remaining stages of the project delivery and for insuring the end product meets the parameters established during Stage 2.

The focal point for the approval process at the end of Stage 3 (Preliminary Design) is normally Regional Programming in regions and Program Planning and Analysis (PP & A) in Headquarters.

The level of approval depends on the total estimated cost as previously defined at Stage 1 (Concept).

PRELIMINARY DESIGN STAGE (Cont'd)

Comments: Throughout Stage 3 (Preliminary Design) close liaison is maintained by the Project Manager with the client and with applicable regulatory agencies. The responsibility for the management of Stage 3 rests with the Project Manager who, in turn delegates the responsibility for discrete activities to individual members of the Project Team.

At the end of this phase, when the design brief has been assessed as satisfactory, the Parks approving authority authorizes commencement of the final design phase which includes preparation of working drawings and specifications.

Approval Milestone:

Project Effective Approval (approval of Preliminary Design Stage and authority to proceed to final design and construction).

PRELIMINARY DESIGN STAGE (Cont'd)

Commitment of Funds:

- construction funds in applicable year of MYOP
- consultant funds

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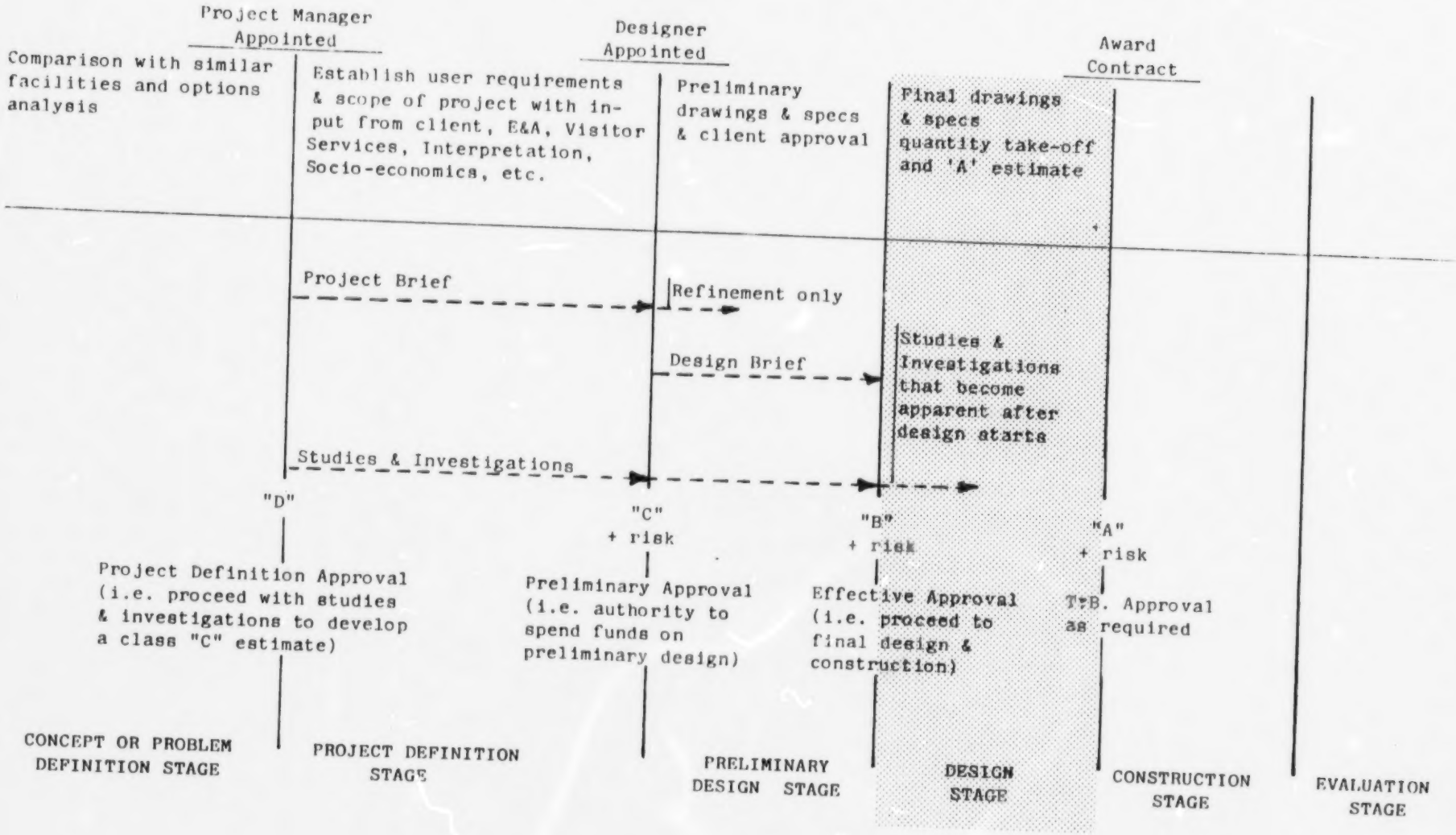
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5.4 DESIGN STAGE

Initiated from: Project Effective Approval

Objective: to produce a set of Tender documents consisting of the working drawings, specifications and other supplementary information. It is the final stage before construction and hopefully no surprise should arise if the process of Stage 2 and 3 have been carefully managed.

Tasks:

- Prepare working drawings and specifications
- Do Class "A" estimate and risk
- Certify construction funds
- Call tender and award contract

Products of the Design Stage:

The products of Stage 4 are the Tender Documents which will be used to obtain final technical and contracts approval of the design and tender package and to seek T.B. approval of the entire project (over $250 K) based on a Class "A" estimate.

DESIGN STAGE (Cont'd)

NOTE 1: If there are any significant changes in scope or budget during the Design Stage, there should be a new Effective Approval. Otherwise the final drawings and specs require E&A Director approval and Contracts approval (if over $250 K).

NOTE 2: In some case, the tendering process may proceed while Effective Approval is being sought provided that all other levels of approval have been previously obtained; however, actual contract award cannot take place until Effective Approval has been received.

A Class "A" is a detailed estimate based on updated unit prices and quantity take-off from final drawings and specifications. It is used to evaluate tenders or as a basis for cost control on day-labour construction.

DESIGN STAGE (Cont'd)

Details regarding tendering/contracting process are amplified in the Government Contracting Regulations and in Contract Services Branch Administration Bulletins.

Consultations and Approvals:

For details refer to the Capital Construction Project Delivery Chart.

Regions may, without the approval of Treasury Board, (through E&A and Contracts Branches) enter into a construction contract if the amount payable under the contract does not exceed:

a) $100,000, or
b) $250,000 and at least two valid tenders have been received, the lowest tender has been accepted and the contract is a firm price contract.

DESIGN STAGE (Cont'd)

In other cases, Region will have to submit a Treasury Board Approval Request to Contract Branch in H.Q.

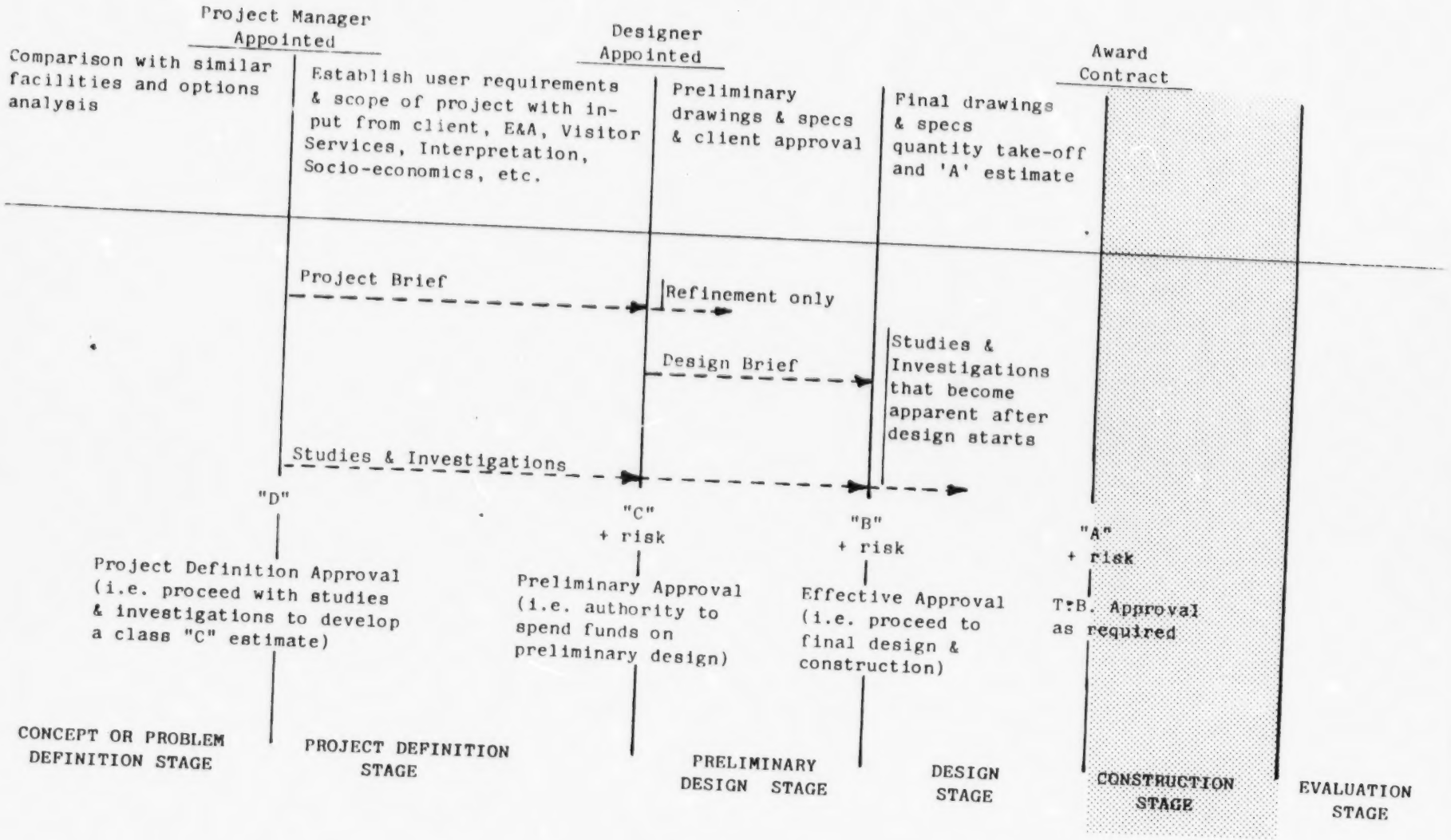
Comments: The project manager's responsibility in this stage is to provide continuity in the overall management of the project. He does this by setting out a work plan for approvals and management of the stage, maintaining liaison with the client/user, handling external relations, obtaining external regulatory approvals, preparing for subsequent stages and finally by compiling and reviewing the Working Documents for approval to proceed to tendering.

Commitment of Funds:

- construction funds in applicable year of MYOP

- consultant and specialist funds

CAPITAL CONSTRUCTION PROJECT DELIVERY SYSTEM OUTLINES


Project Manager Appointed
Designer Appointed
Award Contract
Comparison with similar facilities and options analysis
Establish user requirements & scope of project with input from client, E&A, Visitor Services, Interpretation, Socio-economics, etc.
Preliminary drawings & specs & client approval
Final drawings & specs quantity take-off and 'A' estimate
Project Brief
Refinement only
Design Brief
Studies & Investigations that become apparent after design starts
Studies & Investigations
"D"
"C" + risk
"B" + risk
"A" + risk
Project Definition Approval (i.e. proceed with studies & investigations to develop a class "C" estimate)
Preliminary Approval (i.e. authority to spend funds on preliminary design)
Effective Approval (i.e. proceed to final design & construction)
T.B. Approval as required
CONCEPT OR PROBLEM DEFINITION STAGE
PROJECT DEFINITION STAGE
PRELIMINARY DESIGN STAGE
DESIGN STAGE
CONSTRUCTION STAGE
EVALUATION STAGE

5.5 CONSTRUCTION STAGE

Initiated by: award of contract

Objective: to construct the facility to the requirements of the Contract Documents and in accordance with Government Contract Regulations.

Tasks:

- Manage and administer contruction
- Supervise construction
- Interim acceptance
- Final acceptance
- Authorize Interim and Final Payments

Comments: As it is the responsibility of the Project Manager to provide the overall management of the project, the primary responsibility for the Construction Stage rests with the Project Manager. However, it is understood that the Project Manager must work in close contact with the Construction Supervisor, Contractor and other members of the Project Team in order to achieve the project time, cost and content objectives (see E&A Manual 42.9, Construction Supervision and Field Records).

CONTRUCTION STAGE (Cont'd)

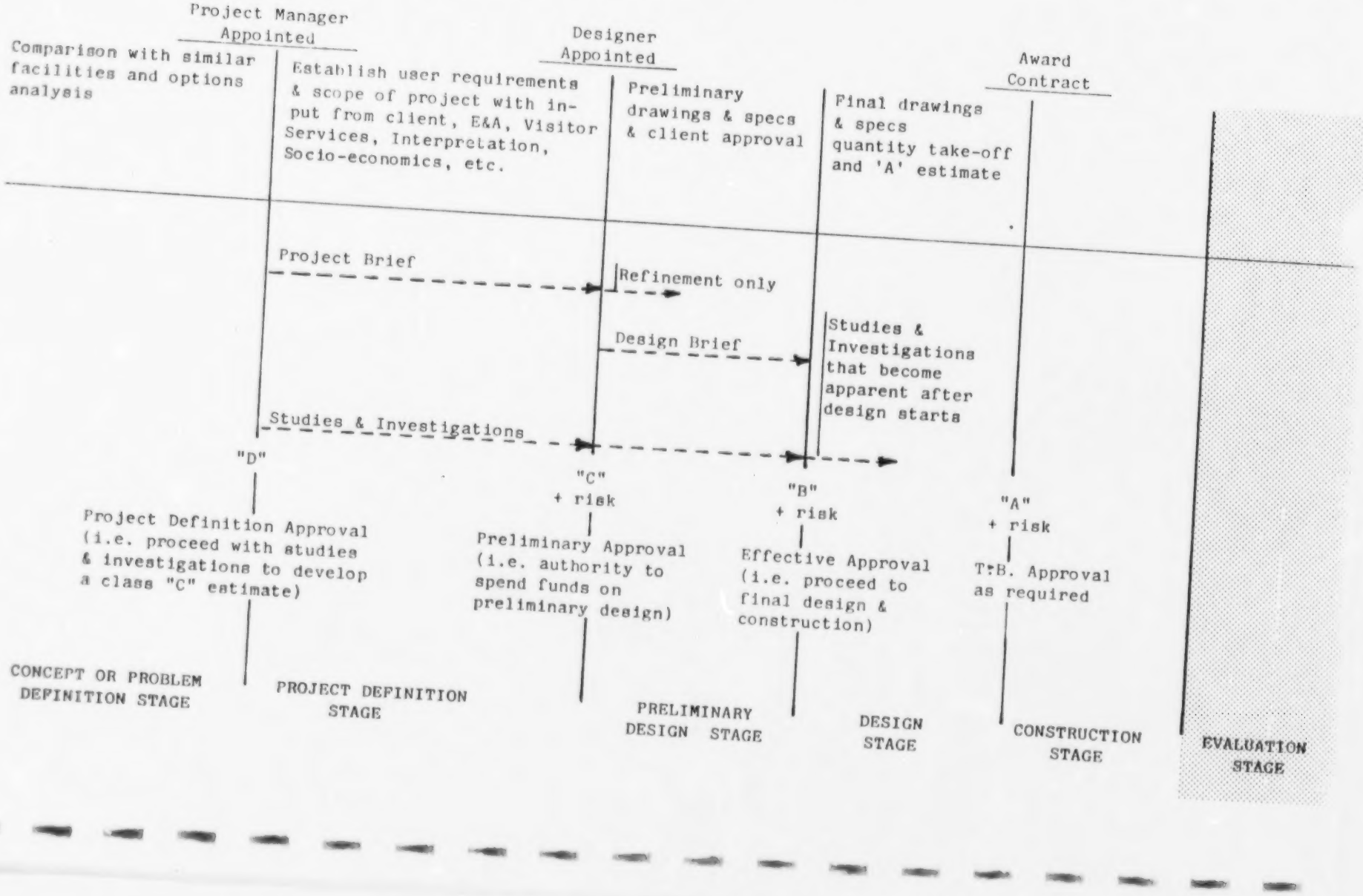
The Project Manager or Construction Supervisor with input from the design team will review the contractor's construction schedule and cost breakdown, conduct construction briefing, review shop drawings, review proposed materials, conduct regular inspections, assess necessity for changes, maintain liaison with the client/user and monitor construction process. He will also assess compliance with schedule, value of completed work, negotiate implications of change, expedite required approvals, issue change orders and supplementary instruction and review progress claims (see E&A 42.9, Construction Supervision and Field Records).

The Project Manager (with input from the design team) will then conduct an interim acceptance inspection in order to identify deficiencies or uncompleted work, which must be finished prior to final acceptance of the project as complete.

CONTRUCTION STAGE (Cont'd)

After the final acceptance inspection, if all deficiencies have been corrected and if all uncompleted work has been finished the Project Manager will issue the final certificate of acceptance, authorized final payment and release of holdback.

CAPITAL CONSTRUCTION PROJECT DELIVERY SYSTEM OUTLINES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Project Brief
Refinement only
Design Brief
Studies & Investigations that become apparent after design starts
Studies & Investigations
"D"
"C" + risk
"B" + risk
"A" + risk
Project Definition Approval (i.e. proceed with studies & investigations to develop a class "C" estimate)
Preliminary Approval (i.e. authority to spend funds on preliminary design)
Effective Approval (i.e. proceed to final design & construction)
T:B. Approval as required
CONCEPT OR PROBLEM DEFINITION STAGE
PROJECT DEFINITION STAGE
PRELIMINARY DESIGN STAGE
DESIGN STAGE
CONSTRUCTION STAGE
EVALUATION STAGE

5.6 EVALUATION STAGE

Project Completion Report:

As the project progresses, information must be compiled on activities being carried out (see E&A Manual 42.9, Construction Supervision and Field Records).

The project completion report, normally prepared by the Project Manager and the Construction Supervisor, is a bank of technical, financial and administrative data dealing mainly with the construction phase of a project. It can be used for various purposes:

- an O&M manual for the users;
- a detailed account of the costs incurred;
- a reference for planning, designing and constructing similar facilities;
- information for the evaluation of the facility.
- litigation

EVALUATION STAGE (Cont'd)

The Project Completion Report contains:

- the project name, location, number and the contract number(s);
- a description of the project;
- the name of the designer(s);
- the name and address of the contractor(s);
- the names of the project manager and project team members;
- the principal dates (contract awarded, beginning and completion of the construction);

Appendices may include:

- Project brief;
- Design brief;
- Project approval documents;
- call for tender;
- tender acceptance;
- program and/or T.B. submission;
- construction schedule;

EVALUATION STAGE (Cont'd)

- change orders;
- requests for contract payment;
- relevant correspondance;
- interim/final certificate of completion;
- acceptance certificate;
- specifications;
- permits;
- shop drawings;
- as built drawings;
- list of major item of equipment and parts, and maintenance instructions;
- specialized report (eg. soil test, inspections);
- copy of the forms of the Capital asset Inventory.

E&A Post-Construction Evaluation
(Functional Review and Evaluation):

This evaluation is normally done by professionals who were not involved in the project.

EVALUATION STAGE (Cont'd)

The E&A post-construction evaluation assesses the effectiveness of the project in meeting its original objectives, and the system used in planning, design and construction. The assessment is carried out on a completed project once the facility is operational.

Sufficient time must be allowed prior to commencement of the evaluation for the facility to be exposed to a complete cycle of use under normal operating conditions (normally a minimum of one full year).

The process consists of:

- observing the performance of the facility under operating conditions;

- monitoring the performance and reliability of all mechanical and electrical equipment;

- reviewing project documents and files;

EVALUATION STAGE (Cont'd)

- interviewing users and personnel associated with the project and with the operation and maintenance of the facility;

- carrying out an inspection of the facility; and

- writing a report.

The report provides feedback to the Regional E&A Manager and to E&A Branch for the improvement of project management procedures and technical policies.

APPENDIX I

E&A PIP Review Check List

PIP REVIEW CHECK LIST*

As a general rule, requests for project approval at each stage should briefly say:

- what
- where
- when
- why
- how

1. Requirements for Project Definition Approval (End of Stage 1, Concept

The proposal should contain the following elements:

a) A description of the need:

The need can address an area within a park or a particular component of the area plan.

b) A statement of the expected end results in terms of objectives:

- social
- economic
- environmental

Objectives to be expressed in measurable terms:

- population to be serviced
- traffic to be borne
- dimentional elements in broad terms

c) A statement on the relationship of the proposed project to the:

- Park/Site Management Plan (specific references)
- Facility Evaluation System (FES)
- Road Inventory and Priority Rating System (RIPRS)

*Note: This checklist has been developed by E&A pending the promulgation of a unified PIP format by PP&A.

d) A statement of the project priority.

e) An initial option analysis report:

- identification of available options
- analysis of each option
- preliminary life-cycle costing of options
- recommendation of an option (and alternatives of an option if available) or for further study during project definition stage.

f) A location or area sketch plan including orientation, critical dimensions and illustrating other physical characteristics of the proposed project (if available).

g) A class 'D' cost estimate.

h) A statement of funding required to do project definition (i.e. studies to develop a class 'C' estimate).

i) A broad scope schedule for all aspects of the project.

2. **Requirements for Project Preliminary Approval (End of Stage 2, Project Definition)**

Request for Project Preliminary Approval should contain:

a) A general summary on the first page (PIP 1) indicating the purpose of the PAD, the overall size, scope and scale of the final product (user requirements).

b) The total cost of the project (expressed as a class 'C' cost estimate plus $ Risk).

c) A Project Brief (may include an Area Development Plan and the topography).

d) A section giving a brief tie-back to Stage 1 (Concept).

e) A section which contains the following, as applicable:

- a final option analysis report
- the financial implications (both O&M and Capital)
- the socio-economic implications
- preliminary EARP statement indicating mitigating measures, if any
- results of research, investigation and studies
- life cycle costing

- land or building acquisition (where appropriate) and investigation
- technical feasibility (i.e. soil investigations)

f) A section detailing the implementation schedule for the project.

3. **Requirements for Project Effective Approval (End of Stage 3, Preliminary Design))**

Requests for Project Effective Approval should contain:

a) A Design Brief

b) A class 'B' estimate (minimum) giving the total estimated cost of the project expressed both in constant and current dollars, including a provision for normal contingencies. Risks are to be estimated separately.

c) Final assessment of any issues which were on-going or outstanding at the time of preliminary approval.

d) Proposals for the management, control and accounting of contingency funds and other specific allowances (eg. inflation, foreign exchange).

e) The cost implications of any reductions or increases in person-years operating costs or capital expenditures that may result from the completion of the project.

f) A comprehensive description of the final product; the nature, basis and justification of the quality standards required, energy consumption target, operating cost target, and other factors which might serve to measure the final product performance.

g) The planned time phasing of the expenditures, including the estimated project completion dates and other cash flow for the years between.

h) The planned arrangements to ensure satisfactory project management and technical performance.

i) A statement that the physical execution of the project has not yet begun, other than the specific aspects authorized in the preliminary approval.

j) Any information concerning public announcements already made or intended to be made.

k) Semi-completed working drawings if felt required by the project manager to provide necessary clarification to the reviewer.

l) A statement from the project manager to attest to the inclusion of all mitigating measures identify in the EARP in the final drawings and specs to follow.

Note 1: On request, the proponents are required to provide any information needed by reviewers to carry out a proper evaluation.

Note 2: For greater detail refer to the "Capital Construction Project Delivery, E&A Manual 42.1".

APPENDIX II

PWC - PARKS RELATIONSHIP

ADM Agreement to Implement Recommendations
of 1986 Analysis

PWC - Parks Relationship

ADM Agreement to Implement Recommendations of 1986 Analysis

1. The General Service Agreement (GSA) (amended 1984) will be fully implemented and requires no modification until fully tried. The Directors General in the regions will be accountable for full implementation by their staff.

2. The following procedures are to be implemented in dealing with Project Briefs, Design Briefs, Specific Service Agreements (SSA's) and Tendering for construction work undertaken by PWC for Parks:

   a. Preliminary discussions on Project Briefs (statement of client requirements) to start at the same time as a project is identified in the MYOP.

   b. Actual preparation of Project Briefs by Parks, in close consultation with PWC, to actually start 42 months before and be completed and agreed to 36 months before construction begins.

Rapport entre le MTP et Parcs

Entente entre les SMA pour mettre en oeuvre les recommandations issues de l'analyse de 1986

1. La convention générale de services (CG$) (modifiée en 1984) sera pleinement mise en oeuvre et n'exige aucune modification tant qu'elle n'aura pas été intégralement mise à l'essai. Les directeurs généraux des Régions seront imputables de sa pleine mise en oeuvre par le personnel relevant de leur compétence.

2. Il faut suivre la procédure que voici pour ce qui est des énoncés de besoins, des encadrements techniques, des conventions particulières de services (CPS) et des appels d'offres ayant trait à des travaux de construction réalisés par le MTP pour le compte de Parcs:

   a. Les discussions préliminaires sur les énoncés de besoins du client doivent commencer au moment de l'inscription des projets au POP.

   b. La rédaction des énoncés de besoins par Parcs, en étroite collaboration avec le MTP, doit commencer 42 mois avant le début de la construction et être achevée et convenue 36 mois avant ce début.

c. The Design Brief (including presentation of alternative conceptual solutions when applicable), which flows from the Project Brief, to be initiated by PWC 36 months before and submitted to the client for approval 32 months before the planned construction.

d. The design stage (pre-engineering and actual design) to cover a 24 month period from the approval of the Design Brief by the client.

e. Tenders to be called 8 months before actual construction takes place, e.g. Fall for Spring/ Summer construction.

f. A Specific Services Agreement (SSA) making reference to the GSA and the Project Brief to be signed by both parties before tendering takes place.

c. L'encadrement technique (comprenant une indication des solutions de rechange conceptuelles, s'il y a lieu), qui découle de l'énoncé de besoins, doit commencer à être rédigé par le MTP 36 mois avant le début de la construction et soumis à l'approbation du client 32 mois avant ce début.

d. L'étape de l'encadrement technique (études techniques préalables et plans) doit être complétée dans un délai de 24 mois après l'approbation de l'encadrement technique par le client.

e. L'appel d'offres doit être lancé 8 mois avant le début de la construction, par exemple à l'automne pour que la construction commence au printemps ou à l'été.

f. La convention particulière de services (CPS) cadrant avec la CGS et l'exposé de projet doit être signée par les deux parties avant qu'on ne procède à l'appel d'offres.

The Directors General will be accountable for their staff meeting the above schedules and the Director, E&A at Headquarters will be responsible for carrying out functional reviews of scheduling in all regions.

Les directeurs généraux seront imputables du respect des délais susmentionnés par le personnel de leurs services et le directeur du G et de l'A au bureau central sera chargé de procéder à des examens fonctionnels de ce respect dans toutes les régions.

3. PWC will provide competent resident engineers with sufficient authority to interpret and enforce contract requirements during actual construction to satisfy requirements during actual construction to satisfy Park's environmental concerns.

3. Le MTP fournira des ingénieurs résidants compétents avec suffisamment d'autorité pour interpréter les conditions contractuelles et en assurer l'application pendant la construction de manière à répondre aux exigences environnementales de Parcs.

4. PWC will provide Parks with adequate backup detail in their invoices.

4. Le MTP présentera à Parcs un degré de détail approprié à l'appui de ses factures.

5. The following procedures will be followed in dealing with significant contractors' claims:

5. On suivra la procédure que voici pour traiter les réclamations importantes des entrepreneurs:

   a. Immediate advice to Parks when notification of intent to claim is received by Public Works Canada.

   a. Le MTP avisera Parcs dès qu'il recevra l'avis de réclamation.

   b. As a standard procedure, PWC to obtain a Department of Justice opinion for use in PWC's assessment of the claim in any case involving legal interpretation or definition.

   b. Le MTP obtiendra automatiquement un avis du ministère de la Justice pour évaluer tout cas de réclamation nécessitant une interprétation ou une définition juridique.

c. PWC to advise Parks of the nature of the claim and its assessment of the merits and implications of the claim.

c. Le MTP indiquera à Parcs la nature de la réclamation et son opinion au sujet du bien-fondé et des répercussions de la réclamation.

d. In the case of major claims with aspects beyond immediate technical concerns, Directors General of both PWC and Parks consult to ensure that all implications are considered.

d. Dans le cas des réclamations dont la portée dépasse les considérations techniques immédiates, les directeurs généraux du MTP et de Parcs de la région se consulteront pour s'assurer qu'il soit tenu compte de toutes les incidences possibles.

e. PWC and Parks agree on a negotiating range based on PWC's development of a best case/worst case analysis.

e. Le MTP et Parcs conviendront d'une marge de négociation à la lumière de l'analyse, par le MTP, des meilleures et des pires possibilités.

f. PWC carry out all negotiations with the contractor. If it becomes apparent that settlement cannot be reached within the established negotiating limits, PWC to again consult with Parks to determine whether negotiating limits should be revised or the claim be allowed to proceed to litigation.

f. Le MTP se chargera de toutes les négociations avec l'entrepreneur. S'il devient évident qu'un règlement est impossible dans le cadre de négociation posé, le MTP consultera Parcs pour déterminer s'il y a lieu de réviser la marge de négociation ou de laisser présenter la réclamation en justice.

Directors General will ensure that the above procedures are adhered to in their region. The Director, E&A at Headquarters will carry out periodic functional reviews to monitor compliance.

Les directeurs généraux s'assureront que cette procédure soit suivie dans leurs régions. Le directeur du G et de l'A au bureau central procédera à des examens fonctionnels périodiques afin de contrôler le respect de la procédure.

6. With regard to engineering staff:

   a. PWC will undertake a detailed study of engineering costs involved in road design and construction projects to ensure effective and efficient use of resources.

   b. Concurrently with the foregoing, Parks and PWC Regional officials will consult concerning the most effective use of engineering personnel in the off seasons.

Directors General will ensure compliance.

6. Quant au personnel des services de génie:

   a. Le MTP réalisera une étude détaillée des frais de génie nécessaires au design et aux travaux de construction routière afin d'assurer une utilisation efficace des ressources.

   b. Pendant la réalisation de cette étude, les autorités régionales de Parcs et du MTP se consulteront au sujet de l'utilisation la plus efficace possible du personnel des services de génie pendant les périodes de relâche de la construction.

Les directeurs généraux assureront le respect de ces conditions.

7. Immediate steps will be taken to enforce general condition 9.9 of the GSA concerning the evaluation of the entire implementation process for each completed project.

Directors General will ensure compliance and the Director, E&A at Headquarters will monitor all projects as part of functional reviews.

8. It was recommended that an audit team be established reporting to the ADM of A&E in PWC with representation by the client to audit Design and Construction work. Dr. Sebastyan and myself have agreed that such an audit team would be activated only on an as required basis.

7. On prendra sans tarder des mesures pour assurer la réponse à la condition générale 9.9 de la CGS, qui consiste à évaluer la mise en oeuvre entière de chaque projet une fois qu'elle est achevée.

Les directeurs généraux assureront la prise de ces mesures et le directeur du G et de l'A au bureau central contrôlera la réalisation de tous les projets dans le cadre des examens fonctionnels.

8. On a recommandé la création d'une équipe de vérification se rapportant au SMA chargé de l'A & G du MTP qui comprendrait des représentants du client et qui serait responsable de la vérification des travaux de design et de construction. Le Dr. Sebastyan et moi avons convenu qu'on ne fera appel à cette équipe qu'au besoin.

CONCEPTUAL FRAMEWORK FOR MAJOR CAPITAL CONSTRUCTION

	STAGE 1 — CONCEPT					STAGE 2 — DEFINITION									STAGE 3 — PRELIMINARY DESIGN							
	IDENTIFY NEEDS & PROBLEM DEFINITION APPROVAL	ESTABLISH GOALS AND OBJECTIVES (CRITERIA)	DEVELOP AND ANALYZE OPTIONS	DO CLASS 'D' ESTIMATE	PREPARE SUBMISSION FOR PROJ. DEF. APPR. (PIP)	PROJECT DEFINITION APPROVAL	SELECT PROJECT MANAGER AND TEAM	ESTABLISH USER O & M REQ'MNTS. (PREL. COST)	PERFORM FEASIBILITY STUDIES (INCL. TECH, SITE, SOCIO EC	ASSESS ENVIR. IMPACT (E A R P)	PERFORM TECHNICAL INVESTIGATIONS	PREPARE PROJECT BRIEF (E & A DOCUMENT)	DO CLASS 'C' ESTIMATE AND RISK	PREPARE SUBMISSION FOR PROJ. PRELIM. APPROVAL	PROJECT PRELIMINARY APPROVAL	TRANSFER OF DESIGN FUNDS	SELECT CONSULTANT FOR DESIGN (OPTIONAL)	PREPARE PRELIM. PLANS AND PRELIM. SPECS.	ESTABLISH TIME & COST SCHEDULING & CONST'N. METHODS	PREPARE DESIGN BRIEF (E & A DOCUMENT)	DO CLASS 'B' ESTIMATE AND RISK	PREPARE SUB FOR PROJ. E APPROV (PIP UPD
H.Q. A.D.M.						✔								(PIP UPDATE)	✔		✔					
DIRECTOR GENERAL						✔									✔		✔					
PROG. PLANNING & ANAL.						●									●		✓					
E. & A.						✓						▼			✓		✓	▽		▼		
CONTRACTS																	●					
SOCIO-ECONOMIC						✓									✓							
FINANCE															▽							
ACTIVITY DIR. GENERAL						✓									✓							
REGIONS DIR. GENERAL	✔					✓	✔	✔							✓	✔	✓					
PLANNING & DEVELOPMENT	▽	▼	▼	▽	▼	●		▼	▽	▽				▼	●				▼		▽	▼
E. & A.	▽	▼	▼	▼	▼		●	▽		▽	✔	✔	✔	▽	✓	▼	▼	✔	✔	✔	✔	▽
E. & A. PROJECT MANAGER								▼	●	●	●	●	●	●	▼	●	●	●	●	●	●	●
FINANCE / CONTRACTS			▽		▽			▽						▽	✓	▼	✓					
OPERATIONS	▽	▼	▼	▽	▽			▼	▽	▼				▼	✓					▽	▽	▼
FIELD SUPERINTENDENT	●	●	●	●	●		▼	●	▼	▼	▽			▼	✓	✔		▼	▼	▼	▼	▼
GEN. WORKS MANAGER	▼	▼	▼	▽	▼		▽	▼	▽		▽			▼				▼	▼	▼	▽	▼
OPERATIONS	▼	▼	▼	▽	▼			▼	▽	▼	▽			▼				▽	▼	▼	▽	▼
OUTSIDE SERVICES (OPT.)			○					○	○	○	○	○	○					○	○	○	○	

* FOR PROJECTS DONE BY OR THROUGH PWC

MONTHS BEFORE CONST'N.

ACTIVITY ⟶

48
- PWC AND PARKS START PRELIMINARY DISCUSSIONS ON STATEMENT OF CLIENT'S REQUIREMENTS

42
- PARKS START ACTUAL PREPARATION OF PROJECT BRIEF IN CONSULATION WITH PWC

36
- PROJECT BRIEF COMPLETED BY PARKS AND SENT TO PWC
- PWC START DESIGN BRIEF

NOTE: REFER TO GENERAL SERVICES AGREEMENT BETWEEN E C PARKS AND PWC FOR PROJECTS CARRIED OUT BY OR THROUGH PWC

CONSTRUCTION PROJECT DELIVERY

	STAGE 3 — PRELIMINARY DESIGN							STAGE 4 — DESIGN				STAGE 5 — IMPLEMENTATION (CONSTRUCTION)						STAGE 6 — EVALUATION	
FER	SELECT CONSULTANT FOR DESIGN (OPTIONAL)	PREPARE PRELIM. PLANS AND PRELIM. SPECS.	ESTABLISH TIME & COST SCHEDULING & CONST'N. METHODS	PREPARE DESIGN BRIEF (E & A DOCUMENT)	DO CLASS 'B' ESTIMATE AND RISK	PREPARE SUB FOR PROJ. EFF. APPROVAL (PIP UPDATE)	PROJECT EFFECTIVE APPROVAL	PREPARE WORKING DRAWINGS AND SPECS.	DO CLASS 'A' ESTIMATE AND RISK	CERTIFY CONSTRUCTION FUNDS (SECTION 25)	CALL TENDER AND AWARD CONTRACT	MANAGE AND ADMINISTER CONSTRUCTION	SUPERVISE CONSTRUCTION	INTERIM ACCEPTANCE (SECTION 27)	FINAL ACCEPTANCE (INCLUDE O & M DOCUMENT (SECTION 27)	AUTHORIZE FINAL PAYMENT (SECTION 26)	PROJECT COMPLETION REPORT	PERFORM POST CONSTRUCTION EVALUATION E & A
	✔						✔				✔							
	✔						✔				✔							
	✓						●				✓	▼						
	✓	▽		▼			✓	▽			✓							▽
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			▼		▽	▼	●		▽	▽							▽	
	▼	✔	✔	✔	✔	▽	✓	✔	✔	▽	▼	✔	▼	▽	▼	▼	▽	●
	●	●	●	●	●	●	▼	●	●	●	●	●	●	●	●	●	●	▼
	✓						✓			✔	✓			▼	▼	▼	▽	
				▽	▽	▼	✓		▽					▽	▽		▽	▽
		▼	▼	▼	▼	▼	✓	▼	▼	✔	▽	▼	▽	▼	✔		▽	▽
		▼	▼	▼	▽	▼		▼	▽			▼	▽	▽	▽			▽
		▽	▼	▼	▽	▼		▽	▽			▽		▽	▽			▽
		○	○	○	○			○	○			○	○	○	○			
							32				8							

MPLETED BY PARKS
H BRIEF

- DESIGN BRIEF SUBMITTED BY PWC TO AND APPROVED BY PARKS
- PWC START DESIGN

- DESIGN COMPLETED BY PWC AND APPROVED BY PARKS
- PWC CALL TENDER

LEGEND

- ● PRIME RESPONSIBILITY
- ✔ APPROVAL
- ✓ RECOMMEND APPROVAL
- ▼ MANDATORY INPUT
- ▽ OPTIONAL INPUT
- ○ OPTIONAL OUTSIDE RESOURCE

ENVIRONMENT CANADA - PARKS OCT., 1986